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(54) **POLYSILICON RESIDUE REMOVAL IN NANOSHEET MOSFETS**

21/3065; H01L 21/823412; H01L 21/823431; H01L 29/0673; H01L 29/66545; H01L 29/66795

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See application file for complete search history.

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(57) **ABSTRACT**

A method is presented for forming a semiconductor device. The method includes depositing a sacrificial layer on a fin structure formed on a substrate and then filled with polysilicon, etching a portion of the polysilicon material via a first etching process, and pre-cleaning the surface native oxide layer. The method further includes etching the remaining polysilicon material via a second etching process, and removing polysilicon etch residue formed adjacent the fin structure by a cleaning process. The pre-cleaning is performed by applying NH_3 (ammonia) and NF_3 (nitrogen trifluoride) or by applying BHF (buffered hydrofluoric acid). The first etching process is RIE (reactive ion etching) and the second etching process involves applying NF_3 and H_2 (hydrogen gas).

(52) **U.S. Cl.**
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(58) **Field of Classification Search**
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